

The Forester

A MONTHLY MAGAZINE

devoted to the care and use of
forests and forest trees and
to related subjects.



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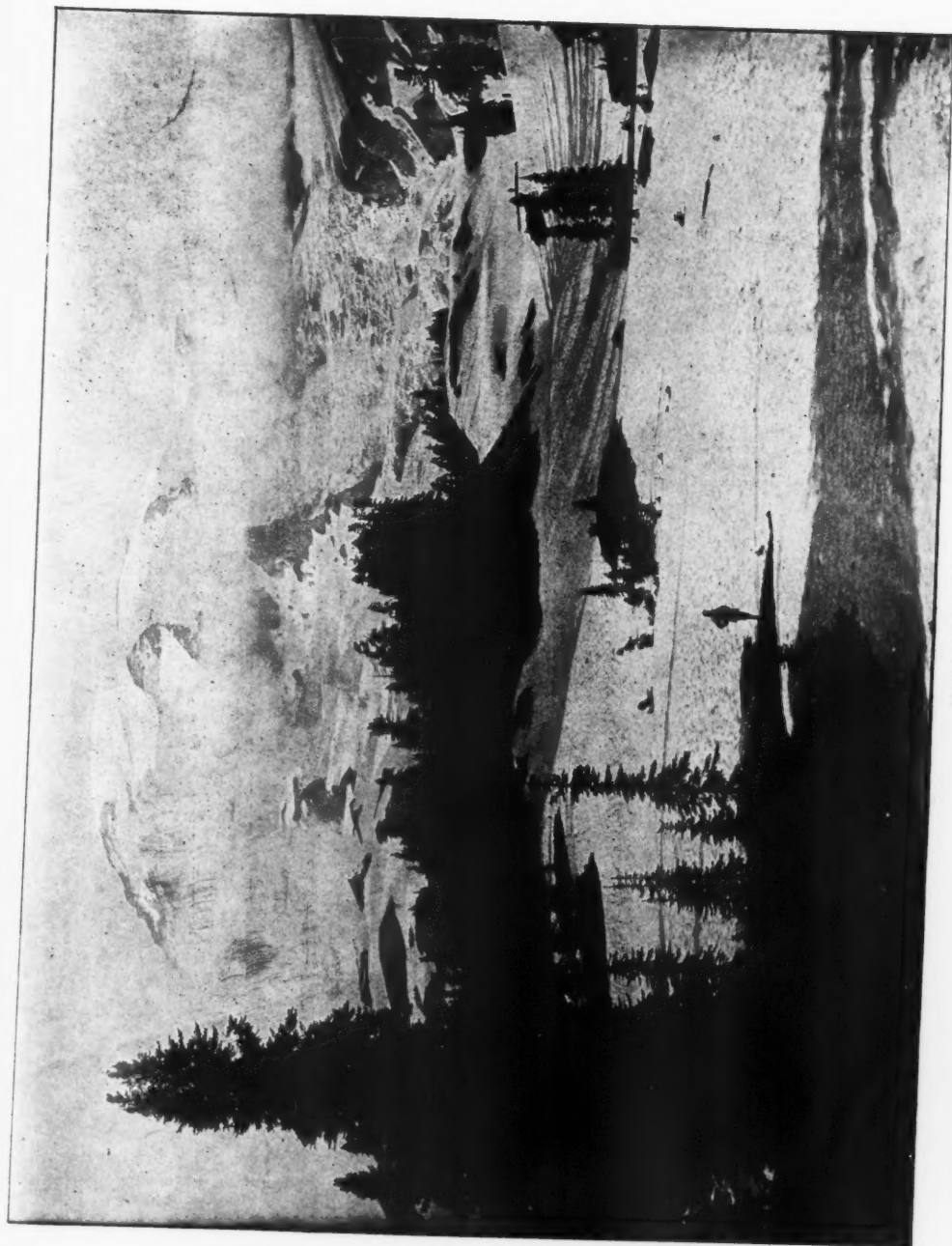
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TRAINING  FORESTERS  AMERICA

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MOUNT RAINIER.

The Forester.

VOL. V.

MAY, 1899

No. 5.

The Mount Rainier National Park.

Compiled partly from official data hitherto unpublished.

[Published by permission of the Director of the U. S. Geological Survey.]

The first suggestion for the establishment of a Rainier National Park came from two widely traveled foreigners. In 1883 they visited Mount Rainier, the one Prof. Karl Zittel, of Munich, a geologist familiar with all the aspects of Europe, and the other the Hon. James Bryce, a member of the English Alpine Club, and a traveler whose mountaineering conquests included Ararat. In a joint letter these gentlemen wrote:

"The scenery of Mount Rainier is of rare and varied beauty. The peak itself is as noble a mountain as we have ever seen in its lines and structure. The glaciers which descend from its snow fields present all the characteristic features of those in the Alps, and though less extensive than the ice streams of the Mount Blanc or Mouta Rosa groups, are in their crevasses and serracs equally striking, and equally worthy of close study. We have seen nothing more beautiful in Switzerland or Tyrol, in Norway or in the Pyrenees, than the Carbon River glacier and the great Puyallup glaciers; indeed, the ice in the latter is unusually pure, and the crevasses unusually fine. The combination of ice scenery with woodland scenery of the grandest type, is to be found nowhere in the Old World, unless it be in the Himalayas, and, so far as we know, nowhere else on the American Continent. * * *

We may, perhaps, be permitted to express a hope that the suggestion will at no distant date be made to Congress that Mount Rainier should, like the Yosemite Valley and the geyser region of the Upper Yellowstone, be reserved by the Federal Government and treated as a National park."

The hope expressed by these foreigners found no response in legislative action until the winter of 1895. Then a memorial prepared by a committee representing the American Association for the Advancement of Science, the Geological Society of America, the Sierra Club of California, and the Appalachian Mountain Club, was presented to the Senate by Mr. Squire, the Senator from Washington. In 1897, the action of which

this memorial was a feature, led to a bill designed to establish a National Park, which passed both Houses of Congress, but failed of signature by the President. In the winter of 1899 this bill, with slight modifications, was again introduced, passed both Houses, and receiving the signature of the President, became a law on March 2.

The bill provides for a National Park eighteen miles square, designed to include the glacial system of Mount Rainier, its parks, and some part of the surrounding forests. The boundaries are laid off according to township and range lines of the Government Land Survey, beginning at a point three miles east of the northeast corner of T. 17 N., R. 6 E, of the Willamette meridian. The square, eighteen miles on a side, is broken on the eastern line to an unknown extent by the provision that: "In locating the said easterly boundary, wherever the summit of the Cascade Mountains is sharply and well defined, the said line shall follow the said summit where the said summit line bears west of the easterly line as herein determined."

It is provided that the National Park shall be under the exclusive control of the Secretary of the Interior, whose duty it shall be to make and publish such rules and regulations as he may deem necessary for the management of the same. The Secretary may, in his discretion, grant parcels of ground for the erection of buildings for the accommodation of visitors, and all the proceeds of the leases, and all other revenues that may be derived from any source connected with the Park, are to be expended under his direction in the management of the same and for the construction of roads and bridle paths therein. Rights of way may be granted to railway or

tramway companies for access to the Park, fish and game are to be protected from wanton destruction, and police authority is given. Provision is made to compensate the Northern Pacific Railway Company for such part of its land grant as falls within the boundaries of the Park, it being authorized to select other non-mineral lands in lieu of those taken. The last section of the law extends the mineral land laws of the United States to the lands lying within the Forest Reservation and Park.

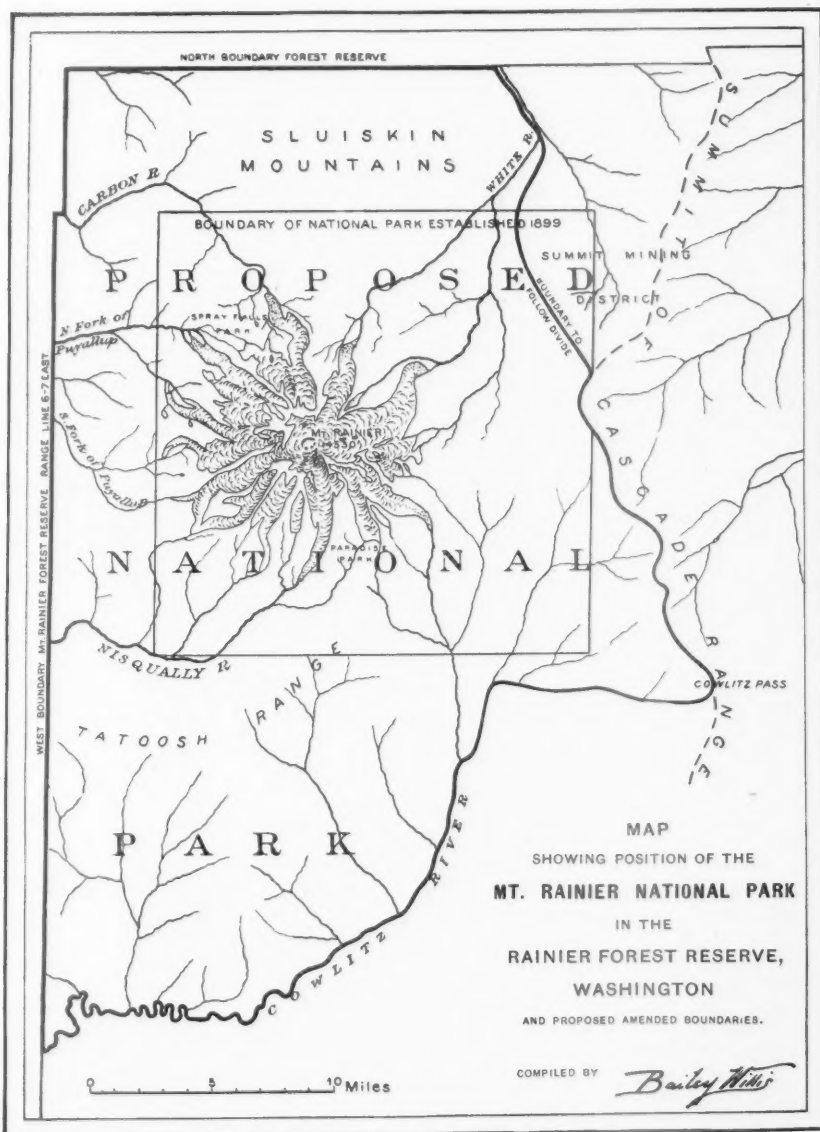
The occasion for creating the Rainier National Park cannot be more concisely stated than in the quotation from Professor Zittel and Mr. Bryce: "The combination of ice scenery with woodland scenery of the grandest type is to be found nowhere in the Old World, unless it be in the Himalayas, and, so far as we know, nowhere else on the American Continent." The district lies wholly on the western side of the Cascade Range, where the moist and equable climate promotes the growth of vegetation, and the heaviest forests of the United States clothe the slopes. These virgin forests of the Cascades are deep and dense. The tall, light-loving trees, tower to heights of 250 feet or more, on relatively slender shafts, which near the ground are 6 to 10 feet in diameter. Beneath their interlacing crowns grow trees more tolerant of shade, bearing branches to within a few feet of the ground. Shrubs crowd among the tree trunks, rising from rich ferneries, vines and matted mosses. The air is damp, the light sombre, the solitude becomes oppressive. But little animal life is seen, and few birds. The wind plays in the tree tops far overhead, but seldom stirs the branches of the smaller growth. The great tree trunks stand immovable. The more awful is it when a gale roars through the timber, when the huge columns sway in unison and groan with voices strangely human. The upper limit of the dense forest is about 4,000 feet above the sea, but trees of less vigorous growth cover the slopes and ridges up to 6,000 feet, and the limit of

tree growth in many places meets the snow line at 7,000 to 7,500 feet.

From the sea of the evergreen forest the gigantic snow peak, Mount Rainier, rises solitarily to an altitude of 14,530 feet. Its form is that of a many-sided pyramid, 5,000 feet in height, rising from a broad and deeply-carved base. The summit consists of three peaks, two of which are nearly a mile apart, and their broad expanse is deeply covered with a mantle of glistening snow. The sides of the pyramid are precipices, which descend into vast amphitheatres. Glaciers flowing from the *nevé* fields of the summit hang upon the cliffs, break in avalanches over their steepest facets, or descend in cascades of flashing ice pyramids to the broader platform. Gathering their spray, as it were, beneath the steep scarps, the ice rivers flow outward in all directions and descend far into the forest-clad valleys. Forest, glacier and precipices combine to form scenes of the wildest grandeur and the deepest sublimity.

Strangely environed in this rugged scenery lie alpine meadows of exquisite beauty. In July and August they bear a richly-tinted flora, comprising more than 400 species of flowers, and they are set with groves of exquisitely symmetrical Firs, whose dark foliage is a foil to the brilliant coloring of the flowers and the pearly aspects of the snow peak. These are the scenes which no student of nature can visit without interest, nor any one view without realizing an inspiring and uplifting influence.

At present there is but one easily accessible route to the Park. This is by stage from Tacoma southward to the Nisqually Valley and thence eastward to Longmire's Springs. The distance is about 60 miles and the roads are not yet adequately constructed. From Longmire's, Paradise Park, one of the mountain meadows on the southern slope, is reached by a mountain trail 7 miles in length. Beyond Paradise Park all excursions involve mountaineering of greater or less difficulty. A second route extends from Wilkeson, at the end



of the railroad north of Mount Rainier, southward across Carbon River to the northwestern spur of the mountain, and reaches a district known as Spray Falls

Park. The distance is about 30 miles over a well-built bridle path, which is now, however, in poor repair. It was at one time easily possible to leave Wilke-

son in the morning and watch the sunset from a camp at an elevation of 7,000 feet on the northwestern side of the snow peak. The wanton destruction by fire of a bridge across Carbon River renders necessary a dangerous ford at that stream, and now makes this route unavailable for any except mountaineers.

Other lines of access which may be opened up but are not now used are (1) from the southwest up the Cowlitz River, which rises in the glaciers on the southeastern slope of Mount Rainier, (2) from the east through the Cowlitz Pass in the Cascade Range, and (3) from the north along the summit of the Cascades. The Cowlitz Pass has repeatedly been examined as a possible route for railroad construction, and it is probable that the establishment of a National Park may lead to the construction of a railroad across the range at this point. In all legislation relating to the National Park, care should be taken not to close the Cowlitz Pass against traffic, as it affords an important line of communication between the Yakima and the lower Columbia Valleys.

Access to Mount Rainier from the north along the summit of the Cascade Range is at present practicable only with a pack train. There is a rough trail which may be followed by mountaineering mules, and which may serve to suggest a great driveway that shall be built to connect the Northern Pacific Railroad with the Cowlitz Pass and the National Park. Such a road will be about 50 miles in length, and will throughout much of the distance run at altitudes of 5,000 to 6,500 feet along the somewhat even crests of the range. For many miles the traveler along this road will have Mount Rainier in view beyond mountain slopes which sink from his feet into the vast expanse of the great forest. Abreast of Mount Rainier the road will be 12 miles distant from the summit, and the splendid snow peak will rise from the depths of canyons far below to a height of 8,000 feet above it. That it is practicable to lay out this road there is no doubt, and that it will be found profitable and will be built is more

than probable. It will challenge the world for its equal in variety and majesty of scenery.

Two central points for tourists are determined by the topography of the district. These are Paradise Park on the south and Spray Falls Park on the north. Both of them lie at elevations of 6,500 to 7,000 feet, between adjacent glaciers. Routes within the Park will be developed chiefly for communication between these two points and for the ascent of the mountain. At the present time to pass around Mount Rainier at a low altitude is an extremely arduous undertaking, and at higher altitudes across the glaciers a task requiring alpine experience. At the higher levels the construction and maintenance of trails will never be practicable, as four-fifths of the way is across the ice and through mazes of crevasses, but below the glaciers trails may be laid out to the east or to the west of Rainier, traversing the canyons and winding through the forests, where the traveler will be charmed with the harmony of tints in the vegetation, delighted with waterfalls, and transported with glimpses of the snowy summit far above them all.

The ascent of Mount Rainier can never become a popular pastime, as under the best conditions it demands unusual strength and steadiness of nerve, yet a considerable number of climbers have already ascended the peak, and with due care the ascent may be made from Paradise Park across Gibraltar Rock and the snow fields beyond without serious risk. Many who might be unequal to the task of ascending and descending the peak in the same day will avail themselves of the caverns within the crater of the mountain. There, protected by a roof of ice from the freezing blasts without, and warmed by the steam which issues from many vents in the old volcano, they may pass the night, dividing their dreams between Jack Frost and Pluto. All other ascents of Mount Rainier than that by Gibraltar involve great risk and should be undertaken only by experienced mountaineers familiar with work among crevasses. The climb has



FOREST ON SLOPE OF MOUNT RAINIER ; ELEVATION 2,000 FEET.

(The diameter of the large Fir at the lowest point seen is about 10 feet. The figure of a man may be seen to the right of it.)

been successfully made up the glacier on the western slope, and also from the northeast and east up the great ice mass that covers the eastern slope, but the conditions which made success possible in these instances are constantly changing with flow of the ice and variations of the seasons.

The boundaries to the Park as now established by law are not well considered for its future development. They are too limited. They fail to include districts whose scenic aspects are essential to the unity of the Park and whose features should not be left outside of its protection. This is most especially true of the western limit, and it is to some extent true of the northern and southern bounds.

According to the best information available, the western boundary of the established Park traverses the spurs of Mount Rainier at altitudes which range from 2,500 feet in the canyons to about 7,000 feet on the ridges. The extremities of several notable glaciers probably extend to or beyond the Park limit. The valley of the headwaters of the South Fork of the Puyallup has a northwest course in the three-mile strip which lies west of the National Park and within the boundary of the Rainier Forest Reserve. The most accessible route for communication around the mountain from the Nisqually Valley to Spray Falls Park should cross the low divide north of the Nisqually and traverse this valley of the South Puyallup. Such a route should be within the Park limits. The valley of the Puyallup is heavily timbered, and if preserved within the National Park may be protected from those operations of the lumbermen which it is part of the economic policy of the Forest Reserve to a certain extent to promote. It is not much to demand that the virgin forest within a strip 3 miles wide by 18 miles long should be preserved for all time to come.

North of Mount Rainier lies a group of jagged peaks rising to elevations of 7,000 to 8,000 feet, known as the Sluis-kin Mountains. The boundary of the

established Park crosses these summits apparently through the highest peaks of the group. It may probably be desirable to extend the National Park northward approximately 6 miles to the northern boundary of the Forest Reserve. The northeast corner of the established Park probably includes some portion of the Summit mining district, which is separated from Rainier by a high spur of the Cascade Range. It may be necessary here to curtail the limits of the Park in such manner as to exclude the mining district.

It has already been stated that the Cowlitz Pass should be left open for railroad construction, but in order that the routes into the Park may have a rational development it is desirable that the Park boundary on the east should extend along the summit of the Cascade Range southeastward to the Cowlitz Pass, and that the southern limit should follow thence down the Cowlitz River probably to the western side of the Forest Reserve. This will include in the Park the Tatoosh Range, south of Mount Rainier. The rugged peaks of this range form part of the environment of the snow mountain, and are to some extent still densely forested. A broad area of burnt forest covers their northern portion and extends to the headwaters of the Cowlitz River. Under the practical management of the Forest Reserve this broad area will be reforested, but it is desirable to preserve that forest against future cutting, except as may be necessary to promote its proper growth, if the object of the National Park as a tourist resort is to be fully attained.

If these amendments to the boundaries should be carried out, the northern and western boundaries would remain straight lines artificially determined by U. S. land surveys; the eastern boundary would be defined by a spur and the crest of the Cascade Range, and the southern boundary by the Cowlitz River. The two last are natural features, always to be preferred, where practicable, to artificial lines extended across a mountainous country.

The bill which has been passed creating the National Park is without effect because it carries no appropriation. Before anything can be done toward the appointment of an administrative force, for the accomplishment of surveys necessary to intelligent plans, or for the protection of the district from careless campers, means must be provided and

modifications of the boundaries must be adopted.

The societies which have been active in presenting the matter to Congress and all who appreciate the inspiring influence of Nature in her most majestic aspects should energetically interest themselves in the further development of the Rainier National Park.

BAILEY WILLIS.

The Training of Professional Foresters in America.

A Symposium in Three Papers.

I. BY THE DIRECTOR OF THE NEW YORK STATE COLLEGE OF FORESTRY, ITHACA, N. Y.

There are many roads leading to Rome and there are many ways of getting an education or a preparation for a profession, and according to the make-up of the man is the one or the other best to travel.

I know a most competent scientific investigator, an excellent teacher and manager, who started life as a cowboy; yet, though undoubtedly his early experience of independent thinking and acting benefited him, we would hardly prescribe such a preparation for general use. The next man might remain a cowboy.

Even if we knew the ideal way to knowledge, practical limitations often forbid to follow it, and finally we find ourselves forced to take the main-traveled, broad road of uniformity, which our educational institutions, schools, colleges, and universities have built, with the prescribed or at least systematically-laid-out curricula, without regard to individual requirements or dispositions, except so far as the student is left to select his studies within a prescribed circle.

For a profession which, like forestry, has to deal with the direct application of knowledge to practical problems, the need of an opportunity to see such application in actuality and to have a hand in the practice early, is obvious, just as

in the engineering or medical profession or in fact almost any other profession. Yet we must not forget that all practice is based on theory; and the more thorough the theoretical knowledge, the more intelligent and more sure will be the practice.

The attempt to satisfy the popular but ignorant cry for so-called "practical instruction" usually leads to the production of superficial and incompetent practitioners, lacking a safe guide in thorough knowledge, although by no means lacking in self-assurance. I would, therefore, advise any student of forestry in this country, as well as in any other, to lay as broad a foundation of theoretical knowledge as he can afford; he will be more successful in the end with his practice.

As to the time and manner of acquiring practical insight, whether it should precede or follow the theoretical studies or be interspersed with the latter, opinions vary. Even the Germans, who have the reputation of being good educators, have not been able during the hundred years of forestry education to come to a final verdict.

Yet, if we may take the number of students as an indication of the preference of methods, we find that the University method which leaves much choice to the student in electing his studies and

seeking practical instruction where and when he can, seems to be in favor, for the College of Forestry at the University of Munich shows by far the largest attendance—namely, 140 students during the last term, more than double that of the best attended separate schools, excepting only its own preparatory school at Aschaffenburg, the total number of students inscribed at all the eight forestry schools being 587.

I should be inclined to advise American students, if they can find the opportunity, to begin their forestry education in some well-conducted lumber camps, in actual employment, either before or after the Freshman and Sophomore years of their college education, so as to learn the practical side of forest exploitation—forestry, largely, being merely an improvement on lumbermen's practice. Then after laying the foundation of theoretical knowledge in professional forestry at the Cornell State College of Forestry, or wherever else it may be attainable with as much practical demonstration in this country, a visit to European forest districts for inspection of object lessons, which are, as yet, not at hand in this country, would be advisable. Such a visit after the theoretical instruction will be more instructive and helpful than if timed otherwise.

As to qualifications, we must not overlook the fact that forestry, like all other professions, when once established, will soon call for specialization. We shall need not only captains, but lieutenants and privates, managers as well as instructors, investigators, etc. In the end, therefore, the qualifications required for this profession are no more nor less than for any other.

Yet before the profession is further established, I would not advise to enter it, any one who is not possessed with a spirit of enterprise and independent thinking, who has not the capacity for finding a way where none is marked out for him, and who has not a large amount of business sense or gumption. For finally the fully-equipped forester is a business manager, whose business it is to turn into profit the product of a forest

property sustained in continuous revenue-producing capacity. This under our economic conditions is not easy and requires judgment. Judgment, to be sure, is formed by experience, nevertheless there is a disposition of mind which ripens experience into judgment, sooner in some than in others. It is alertness of observation and capacity for combination which we call practical sense. The student, therefore, should be sure that he possesses this disposition, that he is interested in technical, as well as in practical things, such as the management of a property represents.

I may only add, that at the newly-established New York State College of Forestry, the aim is to run it on broad University principles, allowing students who have attained the proper degree of knowledge in their Freshman and Sophomore years in Natural Sciences, Mathematics and other supplemental branches, to elect their forestry studies in the Junior and Senior years as they desire, except those studying for a degree, who are expected to elect a complete prescribed course. As much practical demonstration as possible is given during the terms, and there is more opportunity for this than had been anticipated. The summer vacations are to be spent in practical work in the experiment forest or wherever else an opportunity may offer.

The beginning has been encouraging, for during the first two terms there have been in attendance in the five strictly forestry courses (excluding duplication of names in the different courses and also excluding students of the College in the Freshman and Sophomore years), thirty-six students, taking either one or several courses—namely, students of Civil Engineering, Architecture, Agriculture, Political Economy, besides those who propose to make forestry their profession. The experiment forest coming into the possession of the College only by the 1st of April, the work has not yet begun; but the students will be largely employed in making the necessary surveys and working plans.

B. E. FERNOW.

II. BY THE FORESTER OF THE BILTMORE ESTATE, BILTMORE, N. C.

All thinking people realize that the financial result of forestry consists in part of a positive gain obtained, and in part of economic losses avoided—losses threatening navigation, water supply, public health, etc. And all must agree that forestry on a large scale in the long run is not possible unless it be found to be remunerative one way or the other, unless it be established as a well paying business.

The American forester, in almost any position, must be a business man.

Abroad, things may differ where large forest areas are controlled by the commonwealth and municipalities, or consist of entailed property, institutions for which business considerations do not hold good, perhaps, altogether. In this country, at least 85 per cent of all woodland is owned by private individuals, who cannot possibly be compelled to manage their forests for the general welfare, when such management interferes with the owners' financial views.

The American forester, being employed for business purposes, must be well acquainted above all with the economic conditions of the various sections of the United States, and more especially with their lumber interests. The more time he spends traveling in the woods, in the lumber camps, in saw mills and wood-working establishments, the better for him. Knowledge thus acquired will be more valuable to him, the business forester, than a thorough acquaintance with chemistry, physics, zoology, mineralogy, geology and mathematics, with which forest students are packed full in Europe.

If the American forest student masters the principles of botany, surveying, political economy and private law, he will not know enough to pass as an expert, but enough to take a deep plunge into any question connected with forest botany, forest surveying and so on that may present itself; and if he finds the question too difficult for his own head, there are plenty of specialists to whom

he may appeal for help. It is impossible for one single individual to be a thorough botanist, zoologist, chemist, geologist, mineralogist, surveyor, economist and lawyer; besides, more important than the theoretical knowledge, however valuable it may be, is the practical knowledge for the forester as a business man. It is just as little feasible to study forestry from books or at a university alone, as it is possible for the physician to become a master in his branch unless he have large experience in clinic and hospital work. True, the physician must know something of chemistry, of botany, and of physics; but it would be preposterous for him to devote more time to the study of such branches than will be justified by the needs of the practice.

A young man who is anxious to take up forestry as a profession should, I think, adopt the following course of studies:

The first year should be given to the study of botany, surveying, political economy, law and, to a certain extent, mathematics, chemistry, physics and geology. The proper place to study is at a university, which offers concentrated courses suited to the needs of the forest student.

The second year should be devoted to the study of forestry under the guidance of a forester of some experience and in a range where forest administration is conducted on a comparatively large scale. If, as is the case at Biltmore, N. C., daily lectures on forestry are given at the same time, the young man will have a chance for the study of forestry as well as for a sort of apprenticeship, which we might compare to the hospital or clinic practice of a medical student. All operations in forestry (logging, road making, planting, and whatever there be) repeat themselves, as a general rule, in the course of a year. Thus a twelve-months study of forestry at a place like Biltmore seems sufficient.

The third year should be spent partly

in lumber camps and lumber mills; partly on a trip to Germany or France, where silvicultural principles may be studied, and nothing else. The economic conditions on the other side of the water are so different from those prevailing in this country that it is futile to try an adaptation of European forestry to American woods—silvicultural principles excepted.

We cannot import German forestry unless we import German conditions, conditions under which conservative forest management pays better than rapid lumbering. If our lawmakers were filled with the conviction that the commonwealth needs forests, and that it should pay for forest maintenance just as much as that maintenance is worth; if our Government would only provide and pay for a state of affairs making conservative lumbering of forests more remunerative to the owner than rapid forest destruction, we would get "European Forestry" at once.

The legislatures, the people, we ourselves are guilty of committing the crime of deforestation by carelessly allowing conditions to remain unchanged which make forest destruction more remunerative to the owner than forest conservation. Release the heavy burden of taxes on young forests not yielding immediate returns; save maturing forests from the short-sightedness of local tax assessors; protect young and old forests from fire and theft as well as any other property, and you will have forestry, because it will pay.

The change in American forest economy must come, and must come soon. Forest proprietors have anticipated it in sections where the conditions are less unfavorable, and have begun to apply conservative management to the forests which they control.

Still the forests of the United States do not offer illustrations exhibiting the effect of applied silviculture. Even those at Biltmore show only ten years' management. Thus it will be advisable for the forest student to visit countries where silviculture has been practiced for over a century. He simply follows the example of the American artist who studies those masters in the Old World which the New World does not yet offer.

In the course of three years a young man will be ready to fill a position in a forest undertaking. It will depend on the work to which he is put whether he has to enlarge upon his knowledge of botany or on his knowledge of law or political economy and so on, and so on. Neither the physician nor the forester can ever stop learning. It is impossible in this complicated world to be prepared for all emergencies. Any new situation necessitates new study.

Again and again, forestry is business, the forester a business man, and the primary training he needs in order to become a "master of his art," is a common sense and business training.

C. A. SCHENCK.

III. BY THE FORESTER OF THE DEPARTMENT OF AGRICULTURE.

The general objects of training in forestry are: first, to develop what may be called, after the French, the forester's eye—that is, the capacity to observe and understand the condition and needs of forest land; and, secondly, to give such a knowledge of methods and circumstances that the forester may be able to act intelligently, in accordance with the facts he has observed. To reach these ends the forest student must have some

knowledge of physical science, a good working acquaintance with the theory of forestry, and a considerable experience with the forest itself under a variety of conditions. The first step, in my judgment, should be a college or university training, wherever that is possible.

Forest work, on the rougher side, demands great bodily endurance and strong enthusiasm, but there are other divisions of the subject which make less stringent

physical demands. It may be said in general, however, that none but the completely sound in body should undertake the active work of a forester.

The more important auxiliary subjects, a knowledge of which should in most cases be obtained, at least in part, before the training in forestry itself is begun, are:

(1) Botany, emphasis to be laid chiefly on the structure and life of plants. Systematic botany need not be dwelt on at length. The knowledge essential to the determination of the species of trees is, naturally, of great importance. Cryptogamic botany should not be entirely neglected, although only a general view is required.

(2) Geology, with special emphasis on the origin and meaning of the surface features of the earth.

(3) Some Physics and Chemistry is essential, and a slight knowledge of Zoology and Entomology should not be omitted.

(4) Mathematics should include Geometry and Trigonometry, and, preferably, Mechanics also. A good working knowledge of Surveying should be acquired.

(5) Some knowledge of Law and business methods.

(6) German or French, preferably the former, and still better both together.

(7) A good course in Economics.

(8) History and Geography of the United States, with special reference to economic development and production.

A considerable part of these auxiliary subjects may be acquired during a college or university course. If, however, work in forestry begins after graduation and without previous training in auxiliary subjects, it should be commenced by several months of practical work in the woods. Indeed, it will be well, in all cases, for the forest student to begin practical work before plunging too deeply into his theoretical training. For this purpose the position of Student Assistant in the Division of Forestry, United States Department of Agriculture, offers a valuable opportunity

to a few well-qualified men to become acquainted with the true nature of forest work. Students are paid at the rate of \$300 per annum, and all field expenses are borne by the Division.

After such an experience in the field, when the forest student has achieved a correct conception of his future work, the auxiliary training should be begun, followed by a year or more in forestry at a forest school, with the vacations spent in the woods, and, finally, not less than a year abroad. To my mind, this final year is of very great value, because in this country it is not possible to gather an adequate conception of the response of forests to treatment through long periods, or of the application of remedies to defective forests and the results. Forest management in this country is still too young to offer the necessary examples.

It will be essential for the American student to acquire some considerable knowledge of lumbering and the forests in the United States before going abroad, where much that he sees will interest him only as to the principle involved and not as to its practical application.

Not less than three years should, in general, be devoted to the special preparation of a forester for his profession. At that time he may reasonably look for paying employment either from private owners of forest land, such as great companies or wealthy lumbermen, from States such as New York or Pennsylvania, or from the Government, either in the General Land Office, where the national forest reserves are administered, in the Geological Survey, where they are mapped and described, or in the Division of Forestry, to which the general progress of the science and art of forestry is assigned, together with all technical forest work, and in which the interests of the vast area of private forest lands are considered. At present the pay of foresters is on about the same plane as that of the instructors and professors in a university.

GIFFORD PINCHOT.

Timber Protection in Minnesota.

The bill to repeal the Fire Warden Law in Minnesota was defeated at the last session of the Legislature. The wisdom, and, in fact, necessity of affording efficient protection to these timber lands is shown by the following statements.

Commissioner Hermann, of the General Land Office, said :

"Instead of repealing the law it should be made more stringent, and every effort made to bring about co-operation with the Federal authorities. In many instances the public timber of the United States and of a State are so contiguous as to make protection of one protection of the other. This should be mutually in the matter of surveillance. The tendency of most States is to protect the timber interests, and recent legislation in New York is in the interest of forest preservation in the Adirondack region. I have noted, with interest, the relation of Minnesota to timber interests. The State lands of Minnesota aggregate a great deal, and an important part of their value comes from the timber contained on those lands. The forests of that State, I presume, in common with the forests of the General Government, are subjected to great depredations, and the greatest depredator of all is the fire fiend. The loss sustained in one of the last notable fires aggregated more than would compensate for fifty years' appropriations for the administration of forestry. This subject is of great importance to Minnesota, and I cannot understand a desire to relax from the most efficient efforts that can be made for the protection of her forest interests.

"The chief difficulty we have experienced is to secure active co-operation on the part of the States with the Federal authorities in aid of prevention and extinguishment of fires, as well as in the apprehension of depredators on forest lands. Efforts should be made by the Legislatures in all States to make their legislation in line with that of the Federal Government. I have urged that the forest rangers on the several reservations

should be better equipped to enforce the law. Our department has asked the Attorney General of the United States to have United States marshals deputize the rangers to make arrests for offenses committed in defiance of forest regulations. I have been in some correspondence with executive officers in different States asking that co-operation may be had on the part of forest wardens of such States with Government officials, which would inure to the benefit of the Federal and State interests. I would be glad also if the Federal forestry officers could have authority to act as game wardens, so that while protecting timber interests they could also aid in protecting game on the reservations without additional cost to the State

"The State laws of Minnesota for the protection of timber interests are equal, if not superior to, those of any State, and the annual reports of the State officials contain much interesting and valuable information, and it is to be hoped that the State authorities will strengthen rather than detract from the efficiency of their laws for forest preservation. This forestry question is becoming more important every year, and statistics show that if losses by fires are not speedily checked our great timber interests will soon be things of the past. State and Federal authorities in this country may with profit study the results and experiences of Prussia and other European countries in promoting their export trade in timber by wise national laws for forestry preservation and development."

Gifford Pinchot, Forester of the Department of Agriculture, who is familiar with Minnesota's law to prevent forest fires, regards it as one of the best in force. He said :

"If the bill under consideration is intended to do away with the office of chief fire warden and suspend the work which has been conducted by Gen. Andrews I disapprove of it heartily. Whatever the actual accomplishment of Gen. Andrews during his tenure of this office (and in my judgment the good he has done is

very great), the mere fact that there is a law on the statute books intended to guard against the damage from forest fires is in itself of great value. Protection against fire can never be fully successful until it is based on an active and healthy public sentiment.

"Such sentiment, as I understand it, the present law has done very much to promote. That it is capable of improvement I have no doubt, but to repeal it instead of improving it would be a backward step, especially in view of the enormous loss of life and property

caused by so recent a conflagration as the great Hinckley fire.

"The Minnesota law is one of the best and most progressive in force in any of the States, and it would be a national misfortune if it should be repealed. Public sentiment throughout the country has made such important strides in the last three or four years in the direction of a keener and more effective interest in forest protection that any retrograde step is all the more to be regretted."

Tree Planting in Kansas.

Kansas has been settled for a long time, but its timber-covered area is not increasing very rapidly. To readers of the papers it must seem that there are more persons writing about the desirability of increasing the timbered area than there are persons planting trees and tree seed. There are so few planting, because every one wishes to reap the results of his labor at once. They cannot afford to wait a few years. If this Spring and every Spring, land owners would all plant an acre to trees, Kansas would improve in beauty, climatic conditions and prosperity, to such an extent that a Kansan returning to his State fifteen or twenty years hence would scarcely recognize it. Another reason, aside from selfishness and impatience, why so little planting is done, is inexperience. Very few know how easy it is to raise a large supply of forest trees, such as Box Elder, Soft Maple, Ash, Walnut, Pecan, Oak, Catalpa, Honey Locust, and many others. It will take but an earnest trial, properly made, to convince most farmers that they can raise trees as well as corn.

To start a forest plantation by buying the trees is rather expensive; but to start one by raising the trees costs only a little more than the work. Seeds of many kinds may be obtained from trees that grow naturally along the streams. Of other kinds the seed may be purchased of seed supply houses. Addresses of such firms will be furnished by the

Horticultural Department of the Kansas State Agricultural College; or the Department, if requested at the proper season, will often be able to gather and ship seeds of some kinds such as are mentioned above, excepting Pecans, for the cost of the labor.

For Box Elders and Soft Maples the seeds should be gathered in July or as soon as ripe, and planted immediately in loose, moist soil, covered very lightly, not more than one-half inch deep. Four feet apart is a good distance for the rows. They will come up at once; if too thick, they can be thinned, but more and better trees will be obtained by resetting in similar rows, placing the trees a foot apart. In three or four years, with careful cultivation, they will be ready for the plantation.

Most seeds should be gathered in the fall and stored in moist sand till spring. If they are surrounded by a hard shell, as Walnut and Honey Locust seeds, it is essential that they be placed where they will stay moist and be exposed to the freezing and thawing of winter. Plant in spring as soon as the ground will work well, letting the size of the seed govern the depth of covering. Walnuts, Butternuts, and Pecans should be covered two or three inches deep. If the ground is not needed for other purposes, these can be planted where they are to remain; but most trees should be grown in nursery rows for a few years.

With the work and attention one

gives to a potato crop he can in a few years raise trees in vast numbers and of sufficient size for a plantation of many acres. Let every land owner help to cover a proper portion of Kansas with

useful trees, largely for his own good and for the good of those who are to follow.

C. P. HARTLEY,
Kansas Agricultural College.

"False Mahogany" of South America.*

Here, in a growing country, clothed as God seldom has clothed any land with all that makes a forest grand and glorious, stand remarkable trees from which no man's axe has ever taken a chip, and scattered throughout the land are varieties more beautiful than Mahogany.

All things considered, probably the greatest aggregate value in any one variety of tree growing in tropical America, based upon abundance, availability and adaptability, will be found in the "Campano Espabi" or "False Mahogany." The great round magnificent trees grow absolutely clear of surface defects, from which, all conditions being equal, the Indians and Negroes of the entire coast from Honduras down prefer to make the large and beautiful canoes which enter so largely into the lives and methods of these people.

A trunk starting from the root like an upright section of an iron water main, averaged not far from seven feet in diameter, and forty to fifty feet to the first limb, above which there was nothing of value. A tree with a fifteen-foot stump was estimated to contain 65,000 feet of

strictly surface clear. Near by was a completed canoe 43 x 9 x 4½ feet hewn from a tree 13 feet at stump, running 58 feet to the first limb; and neither on stump, canoe nor trunk was there a defect of any kind.

No wood can work more kindly under axe than this, and none can be less affected by time, wind, water, or any of the elements of decay. Your knife will tell you it is as susceptible to finish as walnut; and being free from sap, pitch or gum, you can readily see how it would receive paint. It shrinks so little that a great canoe—broken, abandoned, and so long forgotten as to have good sized trees growing around and over it—stands exposed to the sun and wind, the rain and dews of a tropical climate, and has not opened a single check. I think time will show that in this lies the greatest source of wealth of Colombia's forest resources—but there are others.

*An American explorer, A. H. Winchester, of West Virginia, has written from Cartagena, United States of Colombia, to the *American Lumberman*, an interesting description of that country, from which these excerpts are taken.

At the commencement (March 24) of the Minnesota School of Agriculture, three young women and thirty young men were graduated. This school is taxed to its utmost to care for all those who are knocking for admission within its doors. "Packed like sardines in a box" fully describes the situation there. —*Minnesota Horticulturist.*

It is stated as a conservative estimate of the usefulness of forest reservations

that the forests under the control of the State of New York will be more valuable as a source of income and wealth than all the iron and minerals which the State has produced. —*American Lumberman.*

An association has been formed in Chicago of the retail lumber dealers of Cook County, forty-two of the leading firms being represented in the membership.

The Forthcoming Year-Book.

Review of Two Papers by Gifford Pinchot Relating to Forestry.

(From the advance sheets, by courtesy of
THE SECRETARY OF AGRICULTURE.)

Work of the Division of Forestry for the Farmer.

"No part of the work of the Division of Forestry is without a distinct influence for good upon the farmer: For example, its study of forest fires, recently begun, has the closest relation to the farmers of Minnesota and Wisconsin, while, in all mountainous regions, the protection of the forest from fire is of vital interest to agriculture. So with the supply of lumber, to maintain which is the object of the studies by the Division of methods of lumbering, also recently undertaken with a view to improving their effect on the future of the forest without sacrificing the profit of the lumberman.

"Practical assistance given to the owners of forest lands has the same general object in view. A knowledge of the yearly rate of growth, in cords or board feet, of commercially valuable trees per acre of forest is of great value to every man who owns a wood lot; and this knowledge the Division is engaged in providing, with particular attention to the trees which, like the Loblolly, or Old Field Pine, are sure to increase in importance as time goes on.

"But however close the relation of the others, two branches of the work of the Division are related to the welfare of the farmer in a special manner. The two are concerned with the introduction of suitable trees for planting in the treeless portions of the West, and with the better handling of the wood lots on farms in the regions where trees now grow. * * *

"Of the 623,000,000 acres of farms in the United States, according to the

Census of 1890, more than 200,000,000 are under wood. This enormous total, broken up into wood lots over a very large part of the United States, exerts a most powerful influence on the welfare of the farmer to whom it belongs. Yet, as a rule, the treatment which farmers' wood lots receive is calculated to destroy rather than increase their productive capacity and value. The object of the undertaking described in the pages following is to devise, and assist the farmer in applying, better methods by which the forest on his wood lot will be improved without appreciably increasing the cost of harvesting the forest crop, or simply to apply such methods where they already exist. * * *

"To benefit the owner and the forest at the same time is the real problem. In other words, the cost of harvesting the timber crop from a wood lot in the usual way differs but little, if at all, from the cost of harvesting it, so that its productive value will be improved and increased. Thus, the difference to the farmer in expenditure will be very small, while the difference in result, both to the individual and, from the enormous area of all wood lots taken together, to the nation at large, will be very great."

The pamphlet concludes with a complete working plan for a wood lot at Oakland, N. J., as set forth in detail by Henry S. Graves, superintendent of working plans. This is illustrated by two drawings and numerous tables summarizing the work done. The methods of cutting recommended, the details of the cutting plan, and the rules which should be observed to secure the best results from cutting, are given in condensed form.

Notes on Some Forest Problems.

The public standing of forestry has made notable progress in the last few years. Still the forester and the lumberman are often not fully agreed. Yet "the forester, without the special knowledge of the lumberman, can never do effective work in preserving the forests by using them nor succeed in a money way; while without the methods of the forester the lumberman will speedily exhaust his supplies of timber and disappear with the forests he has destroyed."

Forestry in the treeless West deals with the supply of water as well as wood, and consists largely in tree-planting. "At first blush such work might seem to fall outside the province of the forester, on the ground that it has to do with trees and not with forests. But when it is remembered that protection and wood supply are the two objects of the work, and how important a public service may be rendered by the introduction of better trees and better ways of planting them, it appears at once that this also is one of the tasks of true forestry."

After referring to the deplorable dispersion of the Government's forest work among three agencies, heavy taxes on timber land are characterized as "a premium on forest destruction, a premium that is doing more than any other single factor to hinder the spread of conservative lumbering among the owners of large bodies of timber land," for the reason that these owners cannot afford to hold their lands for a second crop.

Another powerful factor in preventing lumbermen from adopting improved methods lies in their inability to answer this question: "How can the lumberman get out his logs without destroying the capital value of his land?"

Here the Division of Forestry steps in with the offer of practical assistance on the ground, under the conditions set forth in its Circular 21, the fundamental idea of which is "to provide successful examples of conservative lumbering, and by giving them wide publicity to ac-

quaint fresh owners with better ways of handling their timber lands." Applications for such assistance had, at the time the paper in question was prepared, reached more than 1,000,000 acres. At present, we are informed, they surpass 1,500,000.

"The question of forest grazing has aroused more opposition to the forest reserves than any other single issue. At present the advocates of forest protection are successful at many points, though not everywhere. A careful and trustworthy study by Mr. Frederick V. Coville of the effect of sheep grazing, leads to the conclusion that "to regulate pasturage, if it is rightly done, is better than to prohibit it altogether," although "many forest regions should be entirely protected against sheep."

Forest fires are enormously harmful even when, as in the majority of cases, they do not kill the older trees. Light surface fires are often the direct cause of unsoundness and disease. Great fires, while they may destroy the forest temporarily over great areas, are very seldom able to prevent its return in the end. "The devastating fires which have swept over this country for centuries have not succeeded in leaving it barren of trees."

A Bold Stroke for Irrigation.

The Pacific Improvement Company, which is only a convenient name for one of the departments of the Southern Pacific Company, is about to inaugurate a novel and extensive irrigating scheme near Santa Barbara in connection with its seaside Hope Rancho of 2,000 acres, a few miles westward of the city. A 3,000-foot tunnel is to be driven into the neighboring mountain range to draw off storage water at an elevation of 1,100 feet, and with the force generated by piping this water down two miles and a half larger volumes piped from lower levels are to be raised by suction to a height of fifty feet and allowed to pour into Felton Lake, which is on Hope Rancho, and has a storage capacity of 380,000,000 gallons, an area of about

sixty acres and an elevation at its bottom of 138 feet above the level of the ocean.

The plan contemplates the irrigation not only of the Hope Rancho, but of 3,000 acres of rich lowlands in the Goleta Valley, owned by many different persons. It is believed that this district, when properly watered, will produce great crops of superior early vegetables for the Eastern markets, which are already eager buyers of early California celery, peas, carrots and similar vegetables adapted to long-distance shipment. The land, naturally rich for ordinary farming, will, when parceled into small holdings for Chinese or Italian truck gardeners, be worth ten times its present value as a source of revenue to its owners.

The company, by buying 2,000 acres of rugged mountain, has executed a bold stroke, setting completely at defiance all the claims of riparian owners along the creek, the source of which is to be practically undermined by the mountain tunnel. Supreme Court decisions and the testimony of experts are quoted to show that the company has the law on its side. One

of the best known cases is that of Sheffield vs. Gould, in Santa Barbara, in which Gould was upheld in having bored a tunnel into the mountain on his own property and secured by natural percolation water that formerly flowed into a little creek running through the Montecito Valley eastward of Santa Barbara.

Work will be started on the tunnel immediately, and will be prosecuted with vigor. The water system will be completed within a year, so that everything will be in readiness for any further developments incident to the inauguration in May, 1900, of the coast railroad route which runs through Hope Rancho.

It will cost \$25,000 to bore the tunnel, which is expected to yield a constant flow of twenty miner's inches of water, a technical expression better understood, perhaps, by the explanation that twelve inches of water is equivalent to a continuous flow of a stream one foot wide and one inch deep.

State Mineralogist A. S. Cooper, of this city, and City Engineer J. K. Harrington, of Santa Barbara, both recognized authorities on mountain water tunnels, have been perfecting the plans.—*Journal, N. Y.*

Colorado Advice.

It is to be regretted that the legislatures of Colorado have not given more earnest attention to the preservation of the forests of this State. There is no one thing of so much importance. If the time comes when the snows of the mountains are no longer protected by the shade of the trees, the prosperity of the valleys will vanish. The injury may not come to this generation, but will be visited on those that come after us.—*Denver Republican.*

Among the many interests of this Western country some of the more important are our forests. To hold the snows, increase the moisture and abate the winds, our forests should have especial care. The Government is giving them more attention, and minimizing the constant waste and almost willful destruction that have been going on. These forests are a most important factor in the comfort and growth of the West.—*Western Progress, Denver, Col.*

Colorado Experience.

The ice gorges in the North Platte this season are unprecedented. That at the Cheyenne & Northern bridge, a mile south of Orrin Junction, is on a level with the track. Superintendent Rasbock has sent out a force of men with dynamite to blast it away. The bridge built over the Platte last season by the Platte Valley Sheep Company, of which Governor Richards is president, has already been partially wrecked by gorged ice, and its total destruction is said to be inevitable. Higher up the river, at Fairbanks, the county commissioners have had men at work for a week fighting the formation of a gorge, and they are now there personally superintending the work. This latter bridge is of vital importance, as it connects the iron mines at Hartville with the Cheyenne & Northern Railroad at Badger, over which the teams are hauling ore.—*Western Progress, Denver, Col.*

Recent Legislation.

New York.

The New York State Senate, by a vote of 33 to 4, passed Senator Ellsworth's bill appropriating \$300,000 for the continuation of the Adirondack land purchases by the Forest Preservation Board. The Special Committee which considered the bill advised the immediate purchase of additional lands, both for the protection of the watershed of the Hudson, and for the establishment and maintenance of a large tract upon which forest culture may be successfully instituted.

The number of acres of land purchased by the State is the subject of a statement by Superintendent Verplanck Colvin of the State Adirondack Survey. The total acreage of land included within the Forest Preserve to which the State has title is 1,058,444.53. In addition to this, 20,169.75 acres have been contracted for and will be added thereto as soon as it is found that the present owners can give clear title to the land.

Minnesota.

The Legislature has passed the bill entitled, "An act to encourage the growing and preservation of forests and to create forest boards and forest reserves," a review of which was published in the April FORESTER. The bill was approved and became a law April 13.

The Minnesota Senate Committee on Logs and Lumber, after three meetings with the lumbermen and the Surveyor-General of Minnesota, has decided that the fee for surveying logs shall not be reduced from five cents to four cents a thousand, on the ground that it would impair the efficiency of the service.

In the Minnesota House of Representatives, the San Jose scale bill, shorn of its bond and license features, was reported by the forestry committee providing for State inspection to eradicate the insect wherever found, and fixing fines for violations of the law. The bill was killed.

Missouri.

In a recent message to the Missouri Legislature, Governor Stephens says there are about half a million acres of Government land in the State not yet taken up, and that there are 5,000,000 acres of vacant land susceptible of cultivation. The timber supply, of the finest quality of hard woods, will be inexhaustible, it is said, if judiciously handled.

Wisconsin.

The Wisconsin Legislature has under consideration a bill to exempt from all taxation cut-over lands which have been replanted with Pine according to certain provisions.

Arkansas.

An important act of the Senate of the Arkansas Legislature was the passage of the Buckner game bill. The act declares all fish and game, except fish in private ponds, to be the property of the State of Arkansas, and the catching and hunting of the same to be a privilege. It is unlawful for any person to export game or fish from the State unless he personally accompanies it. The fine for violation is from \$25 to \$100. It is unlawful for any agent of freight, express or steamboat companies to receive fish or game consigned to points outside the State. An important provision of the bill is a section which would subject to a \$25 fine a woman wearing a stuffed bird on her hat.

Canada.

Canadian lumbermen from Georgian Bay, Rat Portage and British Columbia who petitioned the Dominion government to impose a duty of \$2 a thousand on American lumber, 25 cents on shingles, and 30 cents on laths, all of which are now on the free list, got merely a hearing at Ottawa. They said that a Canadian duty equal to the Dingley duty would be preferable to reciprocity with the United States. Manitoba, which is a free trade

province, will oppose, because of its advantage in low freights on Minnesota lumber. After the arguments of the delegation had been presented, Premier Laurier intimated that before coming to a decision in the matter officially, the government would afford a hearing to the interests representing the opposite side of the case.

Legislation Pending.

MINNESOTA.—The "Staples Bill," H. R. 529, prohibiting the removal of either timber or mineral from the State lands before the taxes have been paid.

State Auditor Dunn, in a statement, says: "It has been a common practice with corporations and individuals owning thousands of acres of timber lands in the northern part of this State to allow the taxes to accumulate for years, and then go before the county authorities and make a settlement which involves heavy loss to the counties. In many cases the taxes are not paid at all. It requires five years for the State to acquire a perfect title under tax foreclosure proceedings, and in that time the land has been rendered worthless by stripping it of timber."

The auditor also calls attention to a statement of a member of the State board of equalization, before that body last fall, when it was proposed to increase the assessment upon the iron properties in St. Louis County. The member in question advised the board that it would do well to leave the assessment of St. Louis County real estate as it was returned by the county board, for if any increase was made, the owners of producing mining lands would refuse to pay their taxes, and before the property thus delinquent could be brought into the absolute possession of the State all ore would be removed from it, and the State and county would receive no taxes whatever.

Under the law as it now stands, Auditor Dunn says that many owners of Pine lands bulldoze the officers of the smaller counties into accepting whatever taxes they see fit to pay. They tell the officers plainly that if they do not accept the amounts offered they will cut all the

timber from the lands and pay nothing. Not all lumbermen do this, but the auditor says he has personal knowledge of the fact that many of them do.

Many large tracts are owned by non-residents, who have no interest whatever in the State save for the Pine they hold on these lands, and they are willing to resort to any subterfuge to avoid the payment of the taxes.

A Scarcity of Timber and Its Hindrance.

The art of carpentry, as understood in this country, can hardly be said to exist in Persia, the greatest efforts in this department being there confined to the construction of flat roofs of inconsiderable span; and this might be expected from the circumstance of timber being there exceedingly scarce.

For farming roofs a sort of Poplar is generally employed, but for other purposes Oak, Chestnut, Plane, and other kinds of hardwood are used. Hard timber, as sold in bazaars, is all of small scantling, as it has to be brought from the forests on the backs of mules or camels.

In accordance with the invariable custom of all Eastern artisans, the carpenter sits upon the ground while at work. Instead of a bench, a strong stake is driven down before him, leaving about ten inches above ground, and upon this he rests his work and keeps it steady with his feet. The facility with which the work is executed in this position has always been a matter of surprise to European workmen. In the royal arsenals English tools are used, and a better system of working has been introduced under the superintendence of British officers, but in the native workshops the workmen are still to be seen squatting on the ground; and, being used to this position from infancy, and their tools being formed to work with more efficiency when used in this way, any alteration is scarcely to be expected. Their principal tools are the frame saw, adze, planes, hammers, nails, and a few smaller tools.

—*Southern Lumberman.*

Water Supply and Forestry.

If there is one question above another that comes nearer to the people of Southern California, it is that of an abundant water supply—how to get it and how to retain it; in other words, the preservation of forests and water, as the one naturally insures and secures the other. As it is, the rain which falls on our mountains, which have been so much denuded of vegetation, rushes in torrents down the bleak slopes, and is resistlessly carried through the canyons out into the great ocean deep, instead of being arrested by tree and root, branch and blade, and conveyed into the recesses of the earth—nature's great reservoir for the natural storage of a vast supply sufficient to meet all the demands of man.

The thinking, prudent people have become thoroughly awakened to the necessity for taking active measures to remedy the trouble and as far as possible prevent its recurrence. Organizations are being formed, memorials presented to the legislative authorities, State and national, and measures suggested both scientific and practical whereby to further prevent the great forest destruction which has been going on all these years, causing the headwaters of our rivers and streams to be laid bare, so that the water, instead of seeping into the ground and being deposited in the mountain fastnesses of mother earth, is carried off in torrents, causing, in many cases, great flood and waste. It is a question of action by the individual, and by the Government. The individual who owns or controls large land areas should give earnest and immediate attention to this important question.

The Government has wisely created a number of forest reserves, and the policy is being continued in the setting apart of others as their needs are understood and the public necessities require. It is not only the preservation of large trees which is looked after, but also the smaller

growth which in their sphere perform an important function in the economy of nature through every twig and fiber of which the rain and moisture percolates the soil. The question is one of protection and promotion—protecting the existing growth from further destruction by fire or otherwise, and also the promotion of its growth. In this way can the great watersheds be preserved and effectually made to serve the great purpose which nature intended them to do. The primary object of Forest Reserves is stated to be that of saving and improving the forest for the purpose of securing for the people a permanent supply of timber and also insuring conditions favorable to continuous water flow.

Every public-spirited citizen who appreciates and values these conditions is gratified that the Pine Mountain and Zaca Lake Forest Reserve was established, the only regret being that it had not been done long before. What is left in the public domain of the Santa Ynez Mountains—and which is now chiefly valuable for forest-reserve purposes—should have been included, as they are situated right on our borders, in fact at our very doors; so close, indeed, and so important as to seriously influence our continued and permanent water supply, together with the prevention of destructive fires which periodically sweep over them, and not infrequently menace property, and also to guarantee the better care and preservation of the remaining vestige of growth upon them.

It is a question of public concern, a matter extremely vital to our present and future welfare, and it is exceedingly gratifying therefore to know that the proper measures are being taken to have them brought under the supervision of the forest reserve control, so as to secure and perpetuate these important safeguards against the possibility of annihilating our forest and water supply. —*Editorial, Santa Barbara (Cal.), Press.*

THE FORESTER.

A MONTHLY MAGAZINE

Devoted to Arboriculture and Forestry, the
Care and Use of Forests and Forest
Trees, and Related Subjects.

ANNOUNCEMENT.

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SPECIAL ANNOUNCEMENT.

A change in the editorship of THE FORESTER
having taken place during the past month, the
incoming editor desires to call the attention of
exchanges to this fact, with the request that
they note the address of THE FORESTER as given
above, and see that their publications are for-
warded promptly.

EDITORIAL NOTE.

The unfortunate confusion arising from the
great number of popular names for various
species of trees is no better exemplified than in
the case of the great lumber tree of the North-
west, variously known as Red Fir, Douglas
Spruce, Yellow Fir, Oregon Pine, Washington
Pine, Red Pine, Puget Sound Pine, etc. Our
attention has recently been called to the use
of several different names in various issues
of THE FORESTER, and the necessity has be-
come apparent that there should be but one
name for each tree. Most botanists prefer
the name Douglas Spruce on account of its
greater resemblance to Spruce than Fir. The
name Red Fir is used, however, far more
extensively than any other, both in the woods
and in commerce, and on that account it has
been definitely accepted by THE FORESTER and
will be used in all future references to the tree.

The log cut in Maine this season is
estimated to aggregate 400,000,000 feet.

The State Board of Education of North
Carolina has sold a tract of 80,000 acres
of timber lands at \$1 per acre.

The Baltic timber charter controversy
between the shippers and the shipowners
in Great Britain has been settled by a
compromise.

An interesting proof of the power of
wood to stand the ravages of time is
found in the uncovering, near the banks
of the Nile, of several Egyptian boats,
made of cedar probably in use 4,500
years ago.

There is still an immense amount of
virgin timber in West Virginia, but the
present rapid extension of railroads in
that State will doubtless bring every
valley and mountain cove within the
reach of transportation in a few years.

The lumber exports from Norway and
Sweden form a large proportion of the
annual export trade of those countries.
In one year Norway placed over \$16,000,-
000 worth of manufactured lumber in
the markets of the world, while Sweden
exceeded these figures by \$30,000,000
in sawn and hewn lumber alone.

In view of the efforts toward reforest-
ing mountain sides in the West, a suc-
cessful experiment by the Marquis of
Athol, in Scotland, is interesting. The
grandfather of the present Duke planted
hundreds of thousands of Larches on the
barren hillsides of his estate, and saw
them covered in his lifetime by an enor-
mous forest, which began to pay divi-
dends on the investment thirty years
after the planting.

Kansas City is taking up the subject
of tree-planting in the most practical
way. At a recent meeting of the City
Council, ordinances were introduced
authorizing the planting of trees on
eleven different streets, for distances
aggregating about three miles. Four of

the ordinances were passed immediately, and a number of others referred. The newly-appointed city forester, L. F. Timming, is urging immediate action, his plan being to finish all planting before May 1.

A curiosity exists near the Red Bluff Primitive Baptist Church in Ware County, Ga. It is a mammoth Mulberry tree and the heart has long since rotted. Out of the heart of the Mulberry grows a Cherry and a Peach tree, both of which are eight inches in diameter. They grow at a point 10 feet above the ground. All three of the trees are alive and bear fruit every year.

The large number of applications for positions as forest rangers at the Cascade forest reserve, Oregon, coming from men of every walk of life, some of them old men and invalids, has led to the announcement that the reserve is not primarily a sanitarium, and that only those will be appointed who have some knowledge of woodcraft, and who are vigilant, vigorous and fearless in dealing with violators of the forest laws.

At a public meeting in Pasadena, Cal., to arouse interest in the cultivation and protection of the mountain forests of that State, Abbott Kinney, in the course of an address, said that it had cost the Government \$12,000 to fight fires in the neighborhood of Pasadena last year. He advocated the establishment of a well-organized patrol, working on the block system, by which fires might be immediately located and checked. This "ounce of prevention," he said, would cost less than half the amount of last year's losses.

The most noted grove of Walnut trees in the United States, containing fifty-one Black Walnut trees, all of them of enormous size, was sold at Cassopolis, Mich., for \$10,000 cash. There was strong competition from all parts of this country and abroad. The purchasers were German and English parties. The logs will be cut and squared for shipment.

It is estimated that one of the trees will produce \$1,200 worth of choice lumber. It was over one hundred feet of good logging size, its largest diameter was seven feet, circumference 21.99 feet, and it would require five men hand in hand to encircle it.

Forest Fires.

Heavy forest fires raged during the first week of April on three sides of Eastport, L. I., resulting in the destruction of much valuable timber. Two other fires devastated a large area near Quogue and Riverhead. At the latter place the smoke in the village was said to be "uncomfortably thick," which fact, together with the destruction of hundreds of rabbits and foxes in the brush, resulted in energetic efforts to stop the flames. The Pines Hotel at East Hampton was saved by the sturdy fight of volunteers.

Several thousand acres of woodland in Plymouth woods near Wenham, Mass., were burned in the first large forest fire of the season in that State recently. Some very heavy Pine was burned, but most of that consumed was small Oak and Pitch Pine.

Timber Prospects in Cuba.

A trio of Pennsylvanians who went to Cuba to investigate the timber prospects of the island, reached the conclusion that "to invest in timber lands alone would not be a paying investment, but to cultivate lands by raising coffee and tobacco, 'there's millions in it.'" They traveled 300 miles on horseback, cutting their way through forests with machetes, and inspecting 10,000 acres of timber lands, of the following woods: Mahogany, cedro, majagua (a strong, flexible, and plentiful wood, used for furniture, trapeze bars, etc.); jique (a hardwood for finishing work, and making mallets); coguarau, like steel; fustete, or logwood; coguai, similar to coguarau; igaya, for shafts and wagon tongues; almiqui, like rosewood; sabicu, a logwood; roble, used for axe handles; and

almendro, a very springy dyewood. The mahogany was found to be very disappointing, and the uses and value of the innumerable other woods still problematical.

Utilization of Water Power.

A company has been organized in Clear Creek County, Colorado, for the purpose of developing and utilizing the water power in Clear Creek Cañon. The sum of \$800,000 has been raised, all of which will be expended in the construction of the plant, erecting lines for the transmission of power and for the purchase of the necessary real estate and water rights. The contract has been let for the construction of the central plant which is to develop 2,000 horse power. Its location has been so selected that wire can be run to every part of the adjacent mining district at a minimum cost. While at all ordinary stages Clear Creek will furnish enough water to operate the system, the company does not propose to run any chances of loss on account of low water, so it will construct a reservoir above Empire that will have a superficial area of 250 acres. Besides its effect on the local mining industry by supplying a cheaper and more convenient form of motive power this enterprise will benefit the ranchers below the mouth of the cañon, as the storage of water during the spring floods and its use later in the season by the power plant will make it available for irrigation at a time of the year when there is a scarcity of water for that purpose.

Snowslide or Landslide Next?

At 3 o'clock last Saturday afternoon there occurred in this town an accident which was the cause of wonder to hundreds of people who visited the spot from that time until dark.

Gus Wold and H. T. Foy were getting wood on the hillside northwest of town, near the top of the hill, when a dead Pine tree which they had just cut down, started down the slope with fearful ve-

locity, and a few seconds later they heard it go crashing through the houses 2,000 feet below. It ran along within a few feet of B. Flaig's house, and thirty feet below it struck the roof of Iver Olson's kitchen, going through it just like a bullet and passing out above and a little to the left of the front door. Twenty-five feet below this it struck the wall of Mr. Nickerson's dining-room, passed through that and through the floor of the front room and through the basement, which is used as a woodshed. The next house in line was the one occupied by Mr. and Mrs. William Presley, seventy feet below Nickerson's. It entered the back shed above the kitchen door, through to the floor, finally plowing up the floor half way across the front room and stopping when it had penetrated the frozen ground beneath.

The log was fifty-nine feet long and two and one-half feet in diameter at the butt, yet the holes which it made through the different buildings were but very little larger than the diameter of the log. It passed within two feet of a sash door in the Olson building without breaking the glass. But the most remarkable and fortunate feature of the novel accident is that no one was killed or even injured. The effect of such a projectile striking a human being is almost too dreadful to contemplate. Four children were playing in the Olson home when the log passed just over their heads, covering them with snow and broken shingles and scaring them half to death. Mrs. Presley had just left the bedroom, and the moment the log struck, she had just moved to the fore part of the front room—the only safe place in the building. Mrs. Nickerson was at home also, but out of the path of the destructive log.

The men who were the unwilling cause of the disaster were almost beside themselves until they rushed down the hill and learned that no one was injured, when they immediately set to work to saw up the log and repair the damages to the buildings.—*Wardner (Idaho) News.*

Recent Publications.

Biennial Report of the Yosemite Valley and Mariposa Big Tree Grove Commission.—This pamphlet shows the careful attention to the details of the work imposed upon this Commission. Despite the small appropriations for needed improvements and the meagre allowance for traveling expenses necessarily incurred by the members of the Commission, a most commendable showing is made. The Commissioners urge the establishment of free roads and an increase in the protective patrol force on the part of the General Government.

The U. S. Department of Agriculture has just issued Farmers' Bulletin No. 92, under the title of "Experiment Station Work, IX." The subjects included treat of Sugar Beets on Alkali Soils; Planting and Replanting Corn; Improvement of Sorghum; Improved Culture of Potatoes; Second-Crop Potatoes for Seed; Cold v. Warm Water for Plants; Forcing Head Lettuce; The Date Palm in the United States; The Codling Moth; Jerusalem Artichokes for Pigs; Feeding Calves; Pasteurization in Butter Making; Gassy and Tainted Curds, and Pure Cultures in Cheese Making.

Experiment Station Record, Vol. X., No. 8, just issued by the Department of Agriculture, contains a description of the Agricultural Experiment Station in Alaska; the Proceedings of the Twelfth Annual Convention of the Association of American Agricultural Colleges and Experiment Stations; a review of recent work in agricultural science, and other valuable information covering a wide field of usefulness.

Bulletin No. 152 of the New York Agricultural Experiment Station (Geneva) is very timely. It tells how to meet at every stage a pest which was very much in evidence in orchards last year. The bulletin gives a full account, illustrated, of the life-history of the apple-tree tent-caterpillar, with concise directions for recognizing and fighting it when in the egg, as larva, or in the cocoon. Notes are also given upon spraying experiments against the spring canker-worm; and two new insecticides are recommended as both better and cheaper than Paris green. Orchard owners will be furnished free copies of the bulletin upon making request to the Experiment Station.

The report of the Director of the New York Agricultural Experiment Station (Geneva) has been issued as Bulletin No. 153. It will be found of much interest, as it shows what one State institution is doing and trying to do for agriculture. The extension of the buildings, and the different lines of investigation under way during the year are summarized and the most important results noted. Well executed half-tone plates add much to the appearance of the pamphlet. Bulletin sent free upon request.

A review of the experiments made in Long Island in 1898 to determine the amount of fertilizer, per acre, which could be used profitably in potato growing, has been published in Bulletin No. 154 of the New York Agricultural Experiment Station (Geneva), while the sugar-beet industry of the State is reviewed in Bulletin 155. Any of the bulletins of this Station will be sent free upon request.

NOTE.

The edition of THE FORESTER for November, 1898, having been exhausted, it has been found necessary to have a new one printed. Members of the Association and subscribers who may need copies of that issue (No. 11, Vol. IV.) to complete files for binding, will be supplied if they notify the publishers to that effect.

A limited number of complete copies of Vol. IV of THE FORESTER are offered for sale. Price \$1.00. Previous volumes are out of print.

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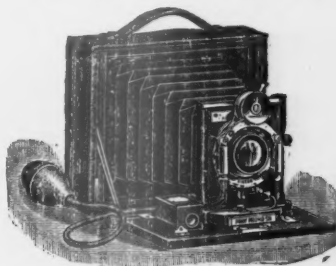
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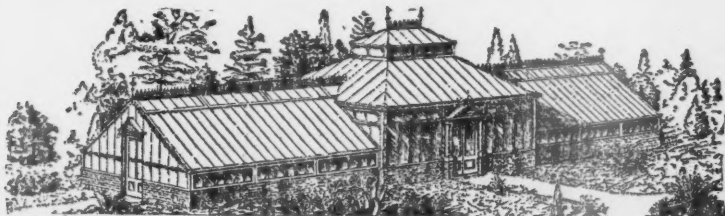
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